Software Development Effort Estimation and Process Optimization

Orsolya Dobán

The need for more and more dependable systems has been increased in the last decades. The strategic decisions during the design of these dependable systems require joint control of the technical and economic aspects, i.e. the estimated cost (development time) and the product quality.

Nowadays the bottleneck in software development is the human capacity both in the terms of time and cost. Reacting to this the software industry supports the development process with high level CASE tools, supporting the formal modeling of the system specification. Our aim was to use the

- UML (Unified Modeling Language) to formalise these product models and the
- UML compatible Software Process Engineering Metamodel to model the development process itself

and to integrate into this development environment a cost estimation method to implement automatic cost predictions gradually refined during the design process.

This paper presents the extension of the Software Process Engineering Metamodel to include the input parameters of the well known COCOMO II. cost estimator.

However optimization of the human resource-allocation becomes a crucial productivity and cost factor in project management. In this case the decision space is confined by the restricted human capacity and the candidate architectural solutions. The well known limits are the development capacity, the available cost, the required quality, the dependability etc. The real task is to find the optimal scheduling of the work to keep the given time limits, or to realize the optimal allocation of the human capacity to reduce the cost of the project.

References

[1] Barry W. Boehm : Software Cost Estimation With COCOMO II, Prentice Hall, New Jersey, 2000.

[2] "Object-oriented modelling and optimization of industrial processes" (1999-2001, Foundation for the Hungarian Higher Education and Research)

[3] Proposal for IKTA project, "Project Management Optimization", 2000.

[4] O. Dobán, A. Pataricza: Cost Estimation Driven Software Development Process, EUROMICRO2001 - Proceedings of the 27th EUROMICRO Conference, ISBN 0-7695- 1236-4, pp. 208., Warsaw, Poland, 4-6 September 2001.